Am ndm nts to Claims

1. **(canc lled)** A process for producing a blend of two or more polyethylenes, comprising the step of contacting:

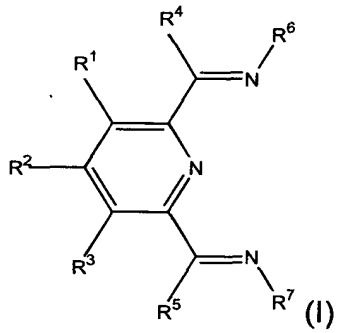
(1) ethylene;

(2) an active ethylene oligomerization catalyst under conditions to oligomerize at least a portion of the ethylene to one or more α-olefins of the general formula $R^{18}CH=CH_2$, wherein R^{18} is alkyl containing an even number of carbon atoms;

(3) a first active polymerization catalyst under conditions to copolymerize ethylene and the α-olefins generated from the active ethylene oligomerization catalyst; and

(4) a second active polymerization catalyst under conditions to polymerize ethylene, but not readily copolymerize ethylene and α-olefins.

2. **(cancelled)** The process as recited in claim 1 wherein the active ethylene oligomerization catalyst is an Fe complex of a ligand of the general formula (I)



(I)

wherein:

R^1, R^2 and R^3 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another taken together may form a ring;

R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or an inert functional group;

R^6 and R^7 are each independently an aryl or substituted aryl having a first ring atom bound to the imino nitrogen, provided that:

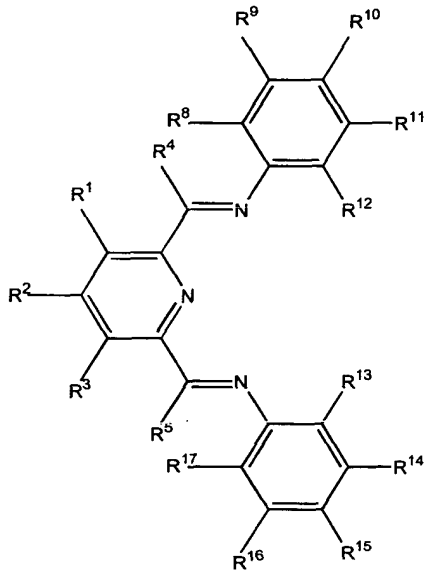
in R^6, a second ring atom adjacent to said first ring atom is bound to a halogen, a primary carbon group, a secondary carbon group or a tertiary carbon group; and further provided that

in R^6, when said second ring atom is bound to a halogen or a primary carbon group, none, one or two of the other ring atoms in R^6 and R^7 adjacent to said first ring atom are bound to a halogen or a primary carbon group, with the remainder of the ring atoms adjacent to said first ring atom being bound to a hydrogen atom; or

in R^6, when said second ring atom is bound to a secondary carbon group, none, one or two of the other ring atoms in R^6 and R^7 adjacent to said first ring atom are bound to a halogen, a primary carbon group or a secondary carbon group, with the remainder of the ring atoms adjacent to said first ring atom being bound to a hydrogen atom; or

in R^6, when said second ring atom is bound to a tertiary carbon group, none or one of the other ring atoms in R^6 and R^7 adjacent to said first ring atom are bound to a tertiary carbon group, with the remainder of the ring atoms adjacent to said first ring atom being bound to a hydrogen atom.

3. **(cancelled)** The process as recited in claim 2 wherein the active ethylene oligomerization catalyst is an Fe complex of a ligand of the general formula (II):



(II)

wherein:

each of R^1, R^2, R^3, R^4, R^5, R^9, R^{10}, R^{11}, R^{14}, R^{15} and R^{16} is independently selected from the group consisting of hydrogen, hydrocarbyl, substituted hydrocarbyl and an inert functional group; and

R^8 is a primary carbon group, a secondary carbon group or a tertiary carbon group;

provided that:

when R^8 is a primary carbon group none, one or two of R^{12}, R^{13} and R^{17} are independently a primary carbon group, an inert functional group or a trihalo tertiary carbon group, and the remainder of R^{12}, R^{13} and R^{17} are hydrogen;

when R^8 is a secondary carbon group, none or one of R^{12}, R^{13} and R^{17} is a primary carbon group, a secondary carbon group, a trihalo tertiary carbon group or an inert functional group, and the remainder of R^{12}, R^{13} and R^{17} are hydrogen;

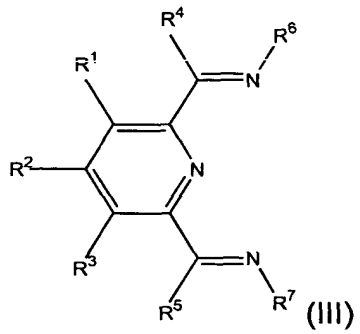
when R^8 is a tertiary carbon group all of R^{12}, R^{13} and R^{17} are hydrogen;

any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and

any two of R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} vicinal to one another, taken together may form a ring.

4. **(cancelled)** The process as recited in claim 1 wherein the second active polymerization catalyst is chemically different than the first active polymerization catalyst, and has little or no tendency to copolymerize ethylene and α-olefins.

5. **(cancelled)** The process as recited in claim 1 wherein the second active polymerization catalyst is an Fe complex of a ligand of the general formula (III):



(III)

wherein:

R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and R^6 and R^7 are aryl or substituted aryl.

6. **(cancelled)** The process as recited in claim 1 wherein the first polymerization catalyst is a metallocene-type catalyst.

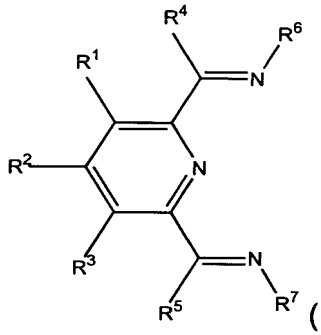
7. **(cancelled)** The process as recited in claim 1 wherein the oligomerization catalyst, first polymerization catalyst and second polymerization catalyst are supported.

8. **(cancelled)** The process as recited in claim 7 carried out in the gas phase.

9. **(cancelled)** The process as recited in claim 1 wherein the polyethylenes are homopolyethylenes.

10. **(canc lled)** The process as recited in claim 2 wherein the second active polymerization catalyst is chemically different than the first active polymerization catalyst, and has little or no tendency to copolymerize ethylene and α-olefins.

11. **(cancelled)** The process as recited in claim 10 wherein the first polymerization catalyst is a metallocene-type catalyst, and the second active polymerization catalyst is an Fe complex of a ligand of the general formula (III):



(III)

wherein:

R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and

R^6 and R^7 are aryl or substituted aryl.

12. **(cancelled)** A polymerization catalyst component, comprising:

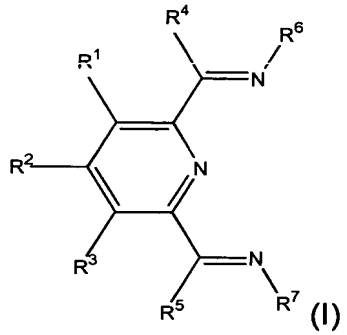
(a) an oligomerization catalyst that oligomerizes ethylene to one or more α-olefins of the formula $H_2C=CHR^{18}$, wherein R^{18} is an alkyl containing an even number of carbon atoms;

(b) a first polymerization catalyst that is capable of copolymerizing ethylene and one or more α-olefins of the formula $H_2C=CHR^{18}$; and

(c) a second polymerization catalyst chemically distinct from the first polymerization catalyst, that is capable of polymerizing ethylene but does not readily copolymerize ethylene and α-olefins.

13. **(cancelled)** The polymerization catalyst component as recited in claim 12, further comprising (d) one or more catalyst supports onto which one or more of (a), (b) and/or (c) has been supported.

14. **(cancelled)** The polymerization catalyst component as recited in claim 12 wherein the ethylene oligomerization catalyst is an Fe complex of a ligand of the general formula (I)



(I)

wherein:

R^1, R^2 and R^3 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another taken together may form a ring;

R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl or an inert functional group;

R^6 and R^7 are each independently an aryl or substituted aryl having a first ring atom bound to the imino nitrogen, provided that:

in R^6, a second ring atom adjacent to said first ring atom is bound to a halogen, a primary carbon group, a secondary carbon group or a tertiary carbon group; and further provided that

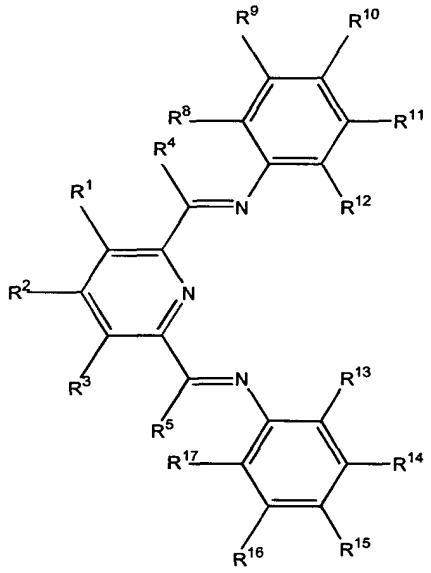
in R^6, when said second ring atom is bound to a halogen or a primary carbon group, none, one or two of the other ring atoms in R^6 and R^7 adjacent to said first ring atom are bound to a halogen or a primary carbon group, with the remainder of the ring atoms adjacent to said first ring atom being bound to a hydrogen atom; or

in R^6, when said second ring atom is bound to a secondary carbon group, none, one or two of the other ring atoms in R^6 and R^7 adjacent to said first ring atom are bound to a halogen, a primary carbon group or a secondary carbon

group, with the remainder of the ring atoms adjacent to said first ring atom being bound to a hydrogen atom; or

in R^6, when said second ring atom is bound to a tertiary carbon group, none or one of the other ring atoms in R^6 and R^7 adjacent to said first ring atom are bound to a tertiary carbon group, with the remainder of the ring atoms adjacent to said first ring atom being bound to a hydrogen atom.

15. **(cancelled)** The polymerization catalyst component as recited in claim 14 wherein the ethylene oligomerization catalyst is an Fe complex of a ligand of the general formula (II):



(II)

wherein:

each of R^1, R^2, R^3, R^4, R^5, R^9, R^{10}, R^{11}, R^{14}, R^{15} and R^{16} is independently selected from the group consisting of hydrogen, hydrocarbyl, substituted hydrocarbyl and an inert functional group; and

R^8 is a primary carbon group, a secondary carbon group or a tertiary carbon group;

provided that:

when R^8 is a primary carbon group none, one or two of R^{12}, R^{13} and R^{17} are independently a primary carbon group, an inert functional group or a trihalo tertiary carbon group, and the remainder of R^{12}, R^{13} and R^{17} are hydrogen;

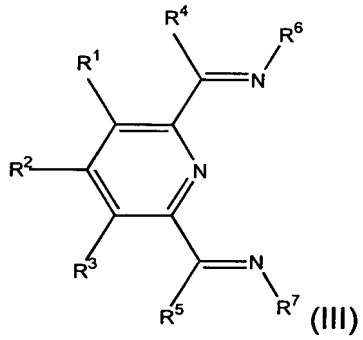
when R^8 is a secondary carbon group, none or one of R^{12}, R^{13} and R^{17} is a primary carbon group, a secondary carbon group, a trihalo tertiary carbon group or an inert functional group, and the remainder of R^{12}, R^{13} and R^{17} are hydrogen;

when R^8 is a tertiary carbon group all of R^{12}, R^{13} and R^{17} are hydrogen;

any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and

any two of R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} vicinal to one another, taken together may form a ring.

16. **(cancelled)** The polymerization catalyst component as recited in claim 12 wherein the second active polymerization catalyst is an Fe complex of a ligand of the general formula (III):



(III)

wherein:

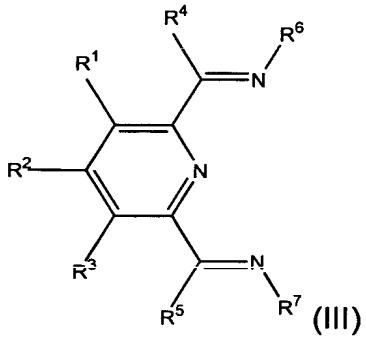
R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and

R^6 and R^7 are aryl or substituted aryl.

17. **(cancelled)** The polymerization catalyst component as recited in claim 12 wherein the first polymerization catalyst is a metallocene-type catalyst.

18. **(cancelled)** The polymerization catalyst component as recited in claim 12 wherein the first polymerization catalyst is a metallocene-type catalyst, and the

second active polymerization catalyst is an Fe complex of a ligand of the general formula (III):



(III)

wherein:

R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and R^6 and R^7 are aryl or substituted aryl.

19. **(cancelled)** The polymerization catalyst component as recited in claim 18, further comprising (d) one or more catalyst supports onto which one or more of (a), (b) and/or (c) has been supported.

20. **(cancelled)** A polymer blend comprising:

(a) a first polyethylene that contains at least three different branches of the formula $-(CH_2CH_2)_nH$, wherein n is an integer of 1 or more, and

(b) a second polyethylene that is different from the first polyethylene,

in a weight ratio of about 1:4 to about 4:1 based on the total weight of the first and second polyethylenes, and provided that said second polyethylene has a melting point at least 20°C higher than said first polyethylene, or said second polyethylene has a heat of fusion at least 50 J/g greater than said first polyethylene, or both.

21. **(cancelled)** The polymer blend of claim 20 wherein the first and second polyethylenes are homopolyethylenes.

22. **(cancelled)** A polymer blend comprising:

(a) a third polyethylene having a density of less than 0.93 g/mL, containing at least 2 ethyl branches, at least 2 hexyl or longer branches and at least one butyl branch per 1000 methylene groups, and provided that said third polyethylene has fewer than 5 methyl branches per 1000 methylene groups; and

(b) a fourth polyethylene having a density of 0.93 g/mL or more.

23. **(cancelled)** The polymer blend of claim 22 wherein the third and fourth polyethylenes are homopolyethylenes.

24. **(cancelled)** A polymer blend comprising:

(a) a fifth polyethylene containing about 20 to about 150 branches of the formula $-(CH_2CH_2)_nH$ per 1000 methylene groups, wherein n is an integer of 1 to 100, provided that said fifth polyethylene has less than about 20 methyl branches per 1000 methylene groups; and

(b) a sixth polyethylene that is different from the fifth polyethylene and has a density of about 0.93 g/mL or more.

25. **(cancelled)** The polymer blend of claim 24 wherein the fifth and sixth polyethylenes are homopolyethylenes.

26. **(new)** A process for producing a blend of two or more polyethylenes, comprising the step of contacting:

(5) ethylene;

(6) one or more α-olefins of the formula $R^{18}CH=CH_2$, wherein R^{18} is alkyl, wherein R^{18} has an even number of carbon atoms;

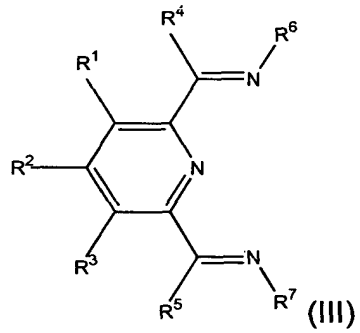
(7) a first active polymerization catalyst under conditions to copolymerize ethylene and the α-olefins generated from the active ethylene oligomerization catalyst; and

(8) a second active polymerization catalyst under conditions to polymerize ethylene, but not readily copolymerize ethylene and α-olefins.

27. **(new)** The process as recited in claim 26 wherein a series of α-olefins of the formula $R^{18}CH=CH_2$ are present.

28. **(new)** The process as recited in claim 26 wherein the second active polymerization catalyst is chemically different than the first active polymerization catalyst, and has little or no tendency to copolymerize ethylene and α-olefins.

29. **(new)** The process as recited in claim 26 wherein the second active polymerization catalyst is an Fe complex of a ligand of the general formula (III):



(III)

wherein:

R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and R^6 and R^7 are aryl or substituted aryl.

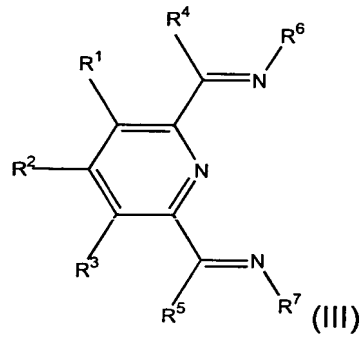
30. **(new)** The process as recited in claim 26 wherein the first polymerization catalyst is a metallocene-type catalyst.

31. **(new)** The process as recited in claim 26 wherein the first polymerization catalyst and second polymerization catalyst are supported.

32. **(new)** The process as recited in claim 31 carried out in the gas phase.

33. **(new)** The process as recited in claim 32 wherein the second active polymerization catalyst is chemically different than the first active polymerization catalyst, and has little or no tendency to copolymerize ethylene and α-olefins.

34. **(n w)** The process as recited in claim 33 wherein the first polymerization catalyst is a metallocene-type catalyst, and the second active polymerization catalyst is an Fe complex of a ligand of the general formula (III):



(III)

wherein:

R^1, R^2, R^3, R^4 and R^5 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, or an inert functional group, provided that any two of R^1, R^2 and R^3 vicinal to one another, taken together may form a ring; and R^6 and R^7 are aryl or substituted aryl.

35. **(new)** The process as recited in claim 26 wherein the first and second polymerization catalysts are both metallocenes.

36. **(new)** The process as recited in claim 28 wherein the first and second polymerization catalysts are both metallocenes.

37. **(new)** The process as recited in claim 31 wherein the first and second polymerization catalysts are both metallocenes.

38. **(new)** The process as recited in claim 33 wherein the first and second polymerization catalysts are both metallocenes.

39. **(new)** the process as recited in claim 26 wherein at least one α-olefin wherein R^{18} contains an odd number of carbon atoms is also present.